## Space Weather Forecast

Issued on Saturday 30 November 2024 at 01:10 Local

**This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Low to Moderate Activity. Slight potential for a G1/Minor Geomagnetic Storm interval Day 3 or Day 4.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Solar activity has been Low during the past 24 hours, with only Common class activity observed. There are around nine active regions currently on the Earth-facing disc. The largest and most complex of these regions lie close to one another in the southwest disc. However, they have remained relatively inactive. A new region emerging in the southeast limb could be considered one or two regions, with latest MOSWOC analysis splitting the region into two. This may change as the region(s) rotate further onto the visible disc and the viewing angle improves. The other regions are generally smaller and simpler, with no sign of notable growth or development.

No Earth-directed coronal mass ejections (CMEs) were observed during the past 24 hours.

**Solar Wind / Geomagnetic Activity:** Solar wind speeds increased from slow to slightly elevated levels early on 29 November due to arrival of a CME which left the Sun on 25 November. Speeds then declined back towards slow-ambient speeds from around 29/0900 UTC. A slight uptick in wind speeds was observed from around 29/2200 UTC with speeds at, or close to slightly elevated levels once more. Total magnetic field strength was generally weak or moderate at first, briefly peaking at strong levels around 29/0340 UTC following the CME arrival before returning to moderate levels. The north-south component of the magnetic field briefly reach moderate negative levels, but otherwise was mainly weakly positive. Since around 29/1740 UTC, the north-south component has fluctuated moderately with a more negative or southward component. Geomagnetic activity was Quiet (Kp 0-2) throughout.

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** Low to Moderate activity is expected with a chance of isolated Moderate-class flares. There is a very slight chance of isolated Strong flares.

**Solar Wind / Geomagnetic Activity:** A coronal mass ejection (CME) seen leaving the Sun on 27 Nov is forecast to arrive on Day 3 (02 Dec), or possibly Day 4 (03 Dec). This CME is forecast to

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either miss or glance the Earth, giving limited impacts. Solar winds are expected to remain at, or close to, slow-ambient levels throughout with coronal hole influence on Day 3 expected to be minimal.

Geomagnetic activity is expected to be mostly Quiet to Unsettled (Kp 1-3), although there is a chance of the glancing blow CME arrival producing Active (Kp 4) intervals, possibly peaking at G1/Minor Geomagnetic Storm (Kp 5) levels although this is considered a low likelihood.

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) is forecast to remain at background levels with only a slight chance of solar radiation storms occurring.

## Geomagnetic Storms

| Geomagnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 1 | 1 | 20 | 10 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

## Radio Blackouts - X-Ray Flares

| X-Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 (M Class) | No | 40 | 40 | 40 | 40 |
| Very Active | R3-R5 (X Class) | No | 2 | 2 | 2 | 2 |

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## Solar Radiation Storms (High Energy Protons)

| Radiation Storms<br>Probability (Exceedance) | Level ($cm^{-2}sr^{-1}s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC)<br>(%) | Day 2 (00-24 UTC)<br>(%) | Day 3 (00-24 UTC)<br>(%) | Day 4 (00-24 UTC)<br>(%) |
|---|---|---|---|---|---|---|
| **Active** | **≥ S1** | No | 15 | 15 | 15 | 15 |
| **Very Active** | **≥ S3 *** | No | 1 | 1 | 1 | 0 |
| * S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$) | | | | | | |

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